

ABSTRACT

An ingot is manufactured by pulling it up such that V/Ga and V/Gb become 0.23 to 0.50 $\text{mm}^2/\text{minute} \cdot ^\circ\text{C}$, respectively, where V (mm/minute) is a pulling-up speed, and Ga ($^\circ\text{C}/\text{mm}$) is an axial temperature gradient at the center of the ingot and Gb ($^\circ\text{C}/\text{mm}$) is an axial temperature gradient at the edge of the ingot at temperatures in a range of $1,300^\circ\text{C}$ to a melting point of silicon. A wafer obtained by slicing the ingot is heat treated in a reductive atmosphere at temperatures in a range of $1,050^\circ\text{C}$ to $1,220^\circ\text{C}$ for 30 to 150 minutes. A silicon wafer free of OSF's, free of COP's, and substantially free of contamination such as Fe and of occurrence of slip, is obtained.